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THE reply of Mr. Fuller, the architect of the New York State Capitol, to the report of the Advisory Board, has been submitted to the Capitol Commission. The architect says that for the chief points of the disposition of the building, to which exception is taken by the Board, he is not responsible, since they were determined for him by the authorities of the State. He implies moreover that several of them have been neglected by the Board themselves in proposing their amendments to his design. He states, for instance, that whereas the commissioners appointed in 1868 required that his original elevations should be increased in height, and they were accordingly made higher, the Advisory Board objected that they were too high; and that finally, in the design submitted by the Board, the salient points are made higher still. He represents also, as we understand him, that the corridor of communication across the Assembly Chamber, which the Board condemns, was added to his plan on account of the objection of the Board, that the connection between the east and west ends of the building was severed by the interposition of the chamber; and that, this corridor being stricken out by them, the connection remains severed as before. Without following his critics into their minute examination of details, he in general terms defends his construction. Their condemnation of his use of galvanized iron he does not discuss, except to say that it need not appear as an imitation of stone unless it is painted to that effect. He believes that to complete the building according to the designs of the Board would be much more expensive than to carry out his own intention.

MR. FULLER objects to the kind of decoration adopted for the upper stories in the designs of the Board, which he considers entirely unsuited to the material (granite) in which the Capitol is built, and out of keeping too with the proper character of the building. He protests earnestly against the use, in the upper part of the work, of a style inconsistent with that of the two lower stories, and quotes in his support the opinions of other architects, among them a passage from a letter by Mr. R. M. Upjohn, who says, "I can hardly believe my eyes, that any architect could recommend ingrafting another style to a building so far advanced as yours has been." To this he adds a letter in his favor, from Messrs. Hunt, Dudley, and Lienau, which we give in our *résumé* of his reply in another column. We have seen it reported by the press, that the Capitol Commissioners have reported to the Legislature their adoption of the designs of the Board, believing that the Capitol might be finished according to those designs, — excepting the central tower and the approaches, — for four and a half million dollars, and that it might be ready for occupation by the 1st of January, 1879. But we are also informed that the plans of the Board are to undergo revision.

A NUMBER of public-spirited citizens of Cincinnati have formed an association, and raised a subscription, to provide the city with a music hall. By the terms of their subscription, two hundred and fifty thousand dollars have been raised among fifty subscribers, who have elected from their own number a board of seven trustees, to administer the funds, erect the building, keep it in repair, and control the use of it. The proposition is to place the building on what is called the exposition lot, belonging to the city, and lying between Elm Street and Plum Street, which the city has been requested to set apart for the purpose. The building when completed is to become the property of the city, the control and maintenance of it only being vested in the trustees. It is a condition of the subscription, that no dividends are to be paid the subscribers, nor is any subscriber or trustee to receive any compensation for his subscription or services, that the hall may be entirely a free gift to the city; and the association has asked for no gift of the land, but only for the right to use and control it as the site of the music hall. The subscriptions were made conditional on the city's accepting the gift with its restrictions, and devoting the lot to its uses. Some opposition was made in the city government to giving up the jurisdiction of city property to the enterprise; but the pressure of public opinion seems to have overcome this, and the order accepting the gift and assigning the land for the purpose has been passed.

THE hall is intended to become the central feature of a group of buildings for exhibition purposes, to be placed in the middle of the principal front of the lot on Elm Street, which is four hundred feet long, and to cover the whole depth, three hundred and fifty feet, to Plum Street. Two designs are before the trustees, one by Mr. J. McLaughlin, and one by Messrs. Hannaford and Proctor. The general provisions are the same in both, — a smaller hall in front, on Elm Street; and a very large hall, with stage and appurtenances, in the rear, that is, on Plum Street. The large hall is to contain seats for about sixty-five hundred persons, including nearly a thousand places for orchestra and chorus. We do not know of any permanent hall in the country that will hold nearly so large an audience.

THE Philadelphians have wisely taken this time to establish a Museum and School of Industrial Art, believing, as they reasonably may, that at the close of the Centennial there will be an unusual opportunity to stock their museum with decorative material that the exhibitors will prefer to sell at moderate prices, rather than carry home with them. It will be remembered that the South Kensington Museum was founded after the British "World's Fair" of 1851, helped by the profits of this the first of international exhibitions, and the only one, perhaps, which has yet left any balance on the credit side of its account. It would be pleasant to believe that the Centennial will furnish funds which may be used to establish such a museum at Philadelphia; but, whether it does or not, it will no doubt leave behind it a new interest and new ideas in decorative art which may secure the success of the school and museum.

THE periodical complaints about the ventilation of the chambers in the Capitol at Washington are revived this winter with unusual force. It is difficult to make out from the published accounts just where the difficulty is, or even what the whole evil is; for some writers complain that both the Senate Chamber and the Representatives' Hall are ill-ventilated, while others say that the ventilation of the Senate Chamber is admirable. Some lay the trouble of bad

air to the bad working of the ventilating apparatus; others condemn the planning of the building, by which the chambers are enclosed on all sides, and shut out from direct sunshine and outer air. It is pretty clear that, at least in the House, the air is apt to be very bad; and the members have given official expression of their dissatisfaction with it. No doubt it would be a great advantage if the chambers were so situated that between the sessions they could be thrown open to air and sunlight, and disinfected as far as this can do it; but during the sessions it would not do at all to depend for ventilation on open windows which let in currents of outdoor air: so that it is absolutely necessary that while the chambers are in use they be supplied with air by artificial ventilation. The statement that the ventilating apparatus of the House itself had become much befouled is doubtless correct; and the untidy ways in which the hall is used are an element in the difficulty, the air registers being commonly receptacles for peanut-shells, cigar-stumps, orange-peel, tobacco-juice, and dust.

The Washington Star had a communication which set forth with some energy one troublesome factor in the problem, — the effluvium from a crowd of squalid loafers who beset the galleries, and for whose exclusion there is no provision. Whoever has been entangled in the *aura* of an unwashed crowd, even in the open air, will realize that the embarrassment mentioned by the Star is not a trifling one. It is possible by mechanical appliances to supply a sufficient quantity of air to carry off almost any human exhalations, the only practical limit being that the mass of air shall not move fast enough to cause inconvenience by its own current. Any such provision needs to be seconded by intelligent watchfulness in those who have charge of the apparatus, by scrupulous cleanliness in the care of the halls, and probably by frequent renewal of the upholstery and carpeting of the chambers. But it may be remembered that crowds are always unwholesome, and that it remains an exceedingly difficult matter to adjust the supply of heat and air to universal satisfaction in a room which is likely to be half full one hour, and crowded to suffocation the next; where the vigorous and the anæmic live side by side, and where one man sits coolly at his desk while his neighbor fumes in violent debate.

MR. FULLER'S REPLY.

The architect of the Albany Capitol, Mr. Fuller, has published his reply to the report of the Advisory Board. His account of the development of his designs for the building states, that when the plans were first approved by the commissioners of the Land Office and the governor, near the end of the year 1867, the size and position of the legislative halls, the central court, and the position of the main tower, which are the subject of criticism in the report of the Advisory Board, were determined by the authorities. Additional commissioners were appointed by the Legislature of 1868; and several changes were made by authority, involving an increase in the height of the elevations, additional height and projection of the porticos, and a change in the treatment of the roofs. At the first meeting of the architect with the Advisory Board, the objections were made to the plans, that the legislative chambers were too large, and were higher than was safe for acoustic effect, the limit determined by experiments at Washington being thirty-two feet; also, that they interrupted the communication between the east and west ends of the building, and that it was desirable to secure this communication on the gallery floor; also, that the court of appeals and the governor's rooms were too large, and that a separate room for the law-library was not needed. It was objected, that the building was too high, and that the small towers on the east and west fronts were superfluous. Modifications in the plans were made, which received a conditional approval, — an approval which was ratified at a later meeting; and the architect was requested to complete his detail drawings and specifications.

In regard to the changes proposed by the Board, the architect says that the area of the legislative chambers is increased, and the ceilings, vaulted in stone or brick, are carried up to a height of fifty feet at the crown. The corridor by which he had provided the required communication between the east and west ends of the building is done away with, in order to recover the light from the lower range of windows. The height of the corner pavilions has been increased, and also that of the roofs on the north and south fronts.

Mr. Fuller agrees with the Board, that the omission of the small towers on the east and west fronts, and of the upper stories of the porticos on all the fronts, might give greater breadth of effect; but objects, that to do it in the way required by the designs of the Board would make it necessary not only to take down all the work above the springing of the window-arches of the principal stories, and eighty feet of both east and west fronts, as well as the four towers on the north and south fronts, to a level twelve feet lower, but to abandon or recut at considerable cost the greater part of the stone now cut for the building.

Of the style of the alterations suggested, Mr. Fuller says, "I consider that any changes that may now be deemed advisable should be carried out strictly in harmony with the building as already erected; and I cannot see any difficulty in so doing. The style adopted for the modifications proposed and shown by the plans prepared by the Advisory Board, and submitted to the Commission this month, is entirely at variance with the plans heretofore adopted, and with that portion of the building already built; and, to be thus grafted on a building so far advanced, would present a most unsightly appearance. The style of these proposed modifications, with its elaborate surface and carved ornamentation, is not applicable to granite, and should only be used on a more free-cutting stone or in terra-cotta; and such decoration, together with the use of polished panels and colored tiles of various shapes and tints, laid in various patterns, however pleasing in small churches, schools, or rustic dwellings, in no manner is expressive of the purposes for which this building is intended. I consider the treatment of the main tower exceedingly unfortunate, and out of all character with the building. The elaborate decoration both of the interior and the exterior, with the pinnacles at the angles constructed of detached columns and pierced tracery-work of Gothic form, are extremely out of place." And, finally, "The exterior stairs and terraces . . . are, in my opinion, likely to very materially detract from the appearance of the building; and projecting, as it is proposed, about one hundred and seventy feet from the east front, would, in the approach from State Street, effectually hide a great portion of that façade."

In regard to the materials of the interior work, the choice of which is criticised by the Board, Mr. Fuller says that the Legislature of last year appeared to be of the opinion that iron and brick should be used, rather than stone, and that he was especially cautioned by the Senate Committee to avoid unnecessary expense in fixing the details of his work. He considers that copper is a better material for roofing than slate, which the Board propose to substitute for it. The galvanized ironwork on the exterior would not, he argues, appear as imitation of stone unless it were painted for that effect. Parian cement he considers to be as appropriate as stone or marble for interior finish, except where the stone can form part of the construction of the walls, which is impossible in the Capitol since the walls are already built in brick. The cement, moreover, he thinks is susceptible of finer finish, and is less easily injured. The iron columns

in the court of appeals, which were also objected to, were important to reduce the bearings of the iron girders of the ceiling, as well as to improve the proportions of the room: if the room is considered too large, he sees no objection to substituting a brick wall for the columns. For the ceilings of the porticos he would have preferred stone to iron; but, in view of the difficulty of securing perfectly sound stone in very large masses, he thinks it would be unsafe to trust to it for spans of twenty-two feet.

The recommendation of the Board, that the windows should be subdivided by mullions and transoms, he intimates is inconsistent with their complaint that the rooms are insufficiently lighted, besides which they cannot now be made part of the construction; and he considers that the wooden sliding sashes of the original design are better and less likely to get out of order than the iron sashes hung on pivots, which the Advisory Board would substitute for them. On the whole, he feels sure that, if the building is finished as proposed by the Board, its cost will be considerably increased.

Mr. Fuller expresses surprise that the report of the Board should charge upon him, as he assumes that it does, the whole responsibility of the disposition of the main parts of the building, the adoption of a central court, the placing of the main towers and legislative hall, and the dimensions of the rooms; all of which, he says, were fixed by the State authorities. He cites the expressed opinion of various architects against the modifications proposed by the Advisory Board, giving the following communication from Messrs. Hunt, Dudley, and Lienau, of New York: —

New York, March 14, 1876.

Thomas Fuller, Esq., Architect of the State Capitol at Albany.

Dear Sir, — In accordance with your request, we the undersigned have carefully considered the proposed alterations suggested for the completion of the State Capitol, as published in the American Architect and Building News, March 11, 1876; and we are unanimous in the opinion that the suggested alterations are no improvement on the original design, and, furthermore, that the style adopted is totally at variance with the portions of the building already erected.

The proposed changes for the Assembly Chamber we consider defective, inasmuch as thereby all communication between the east and west ends of the building is sacrificed on that side, for no commensurate gain.

Furthermore, we consider that the arrangement of terrace and approaches, as shown by the model, is decidedly preferable to that suggested; not only as regards the building, but also the surroundings. It is unnecessary for us to offer any suggestions concerning minor points, such as the height in the corridors, the various materials to be used, &c., as undoubtedly they can all be satisfactorily arranged.

Truly yours,

(Signed) R. M. Hunt,
Henry Dudley,
D. Lienau.

THE HABITATIONS OF MAN IN ALL AGES.

BY VIOLLET-LE-DUC.

IV. — The Dwellings of the Egyptians under the first three Dynasties.

The Egyptians, having a great respect for the dead, and believing in the immortality of the souls of all animated beings, buried their relations, having secured their remains against corruption by special processes, in natural or excavated caverns; concealing their bodies under piles of stones and unburnt bricks, as a further protection to prevent their place of sepulture from being violated.

They gave to such piles the name of *Pi-rama*, which means height; or *Pi-re-mi*, according to others, — meaning *Splendor of the Sun*.

These piles are raised on a quadrangular base, as are all Egyptian buildings; and rise to a greater or less elevation, according to the area of this base, and the inclination of the faces. Now, after the earthquake just mentioned, the ablest of the Egyptian *savants* having ascertained that these pyramids, even when hollow, and with walls comparatively thin, had not suffered any derangement, met to discuss the question whether it would not be advantageous to give future habitations the form of these erections.

Epergos and Doxius were consulted. Epergos, having observed that the Egyptians possessed a considerable acquaintance with geometry, took a bit of charcoal, and drew on the wall the figure 30, below; then he said, —

"If the solid A is placed on the level ground *ab*, it will keep upright by its own mass; but if the ground inclines, as *cd*, all the part B of the solid must break off and fall. If, on the other hand, the solid C is placed on a level ground *a'b'*, and if this ground inclines, as *c'd'*, no part of this solid can break away, since the whole of it remains within the vertical line V O; this is why your pyramids stood while your houses fell.

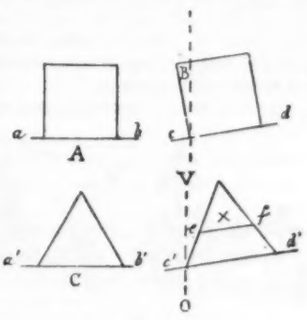


Fig. 30.

"But these earthquakes, as I have had the opportunity of ascertaining elsewhere, shake the ground, rather than disturb its level; or, at least, this disturbance of level is scarcely felt: you need, therefore, only give your houses a slight inclination to keep them standing, in the event of an oscillation of the ground. But it is not necessary to terminate them in a point like your pyramids; for, suppose the part x of the pyramids taken away, the part *c'*, *d'*, *e*, *f*, which will remain, will not be less stable."

The assembly listened attentively to Epergos. When he had concluded, an old man who was reputed to be one of the most intelligent of their *savants*, and who was accustomed to observe the stars in order to ascertain the periods favorable to the various agricultural operations, arose, and, slowly advancing to the wall on which Epergos had drawn the diagrams given above, took the piece of charcoal in his turn, drew the figure 31, and said, —

"Thy reasoning is good, Epergos; but neither the houses nor our pyramids are made in one piece; both consist of materials whose cohesion is limited. If, therefore, the house A inclines in the direction of the line *ab*, in consequence of a movement of the ground, though the line *dc* does not go beyond the vertical, the materials *e* may slip under pressure, and thus the whole building be dislocated. But if we lay the courses of brick or stone according to the sketch D, taking E as the centre of the segments of the

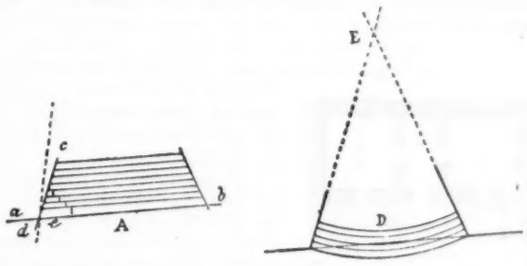


Fig. 31.

circle, — the point, viz., towards which the two slanting lines which form the faces of the walls converge, — the corner-stones will scarcely be affected by the pressure, and will not be able to slip, since they will not be on an inclined plane."

Epergos lowered his hands to the level of his knees, in token of respectful acquiescence, and bowed his head; and the old man returned to his place amidst a hum of approval. Epergos was the only one who made a fresh suggestion, which was to the effect that if, instead of adopting quadrangular bases, they constructed their dwellings on a circular plan, inclining the beds of the courses inwards, the stability would be perfect, and there would not be a weak point anywhere round the building. This proposal was received with a loud expression of dissent; and one of the most respected members of the assembly, rising, said, "The dwelling of man should face the four points of the heavens; that is a sacred custom. It is becoming that such a structure should have a front and sides, which a circular building cannot possess. It should have its corners; and these corners ought to be square. Epergos spoke without due consideration."

"Certainly!" answered the assembly with one voice.

The royal decree promulgated at the recommendation of the assembly was to the following effect: that the walls of dwellings to be erected should be inclined according to an angle prescribed by the inspectors of buildings; that, if the houses were raised on stone basements, the courses must be laid in the direction of the part of a circle given by a radius equal to one of the sides of the triangle, whose apex should be the intersection of the slanting lines of the walls; that the same plan should be adopted for buildings made of unburnt bricks; that, moreover, the ancient and hallowed form of these houses, whether in plan or elevation, should not be altered in any way.

The first houses, therefore, that were erected after this decree,

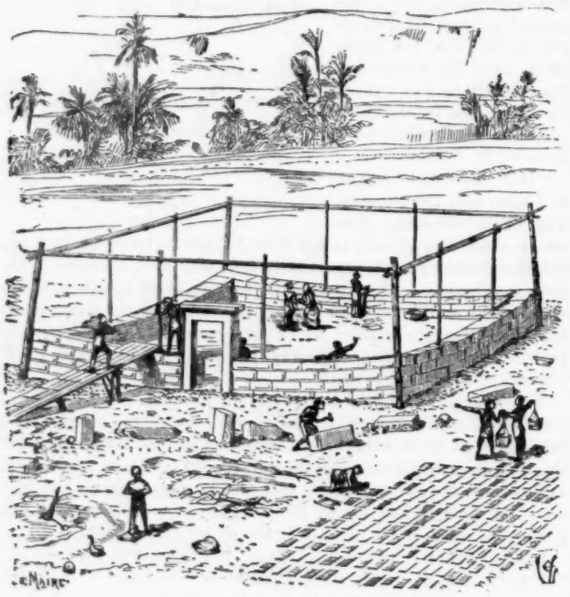


Fig. 32.

exhibited basements built as shown in fig. 32; and guide-rods of canes were always employed to direct the masons.

While the poorer class always built houses with clay and canes, those who had become rich, and who held offices in the state, were no longer content with abodes so simple and perishable. They began to use blocks of stone, unburnt bricks, carefully plastered, and timbers squared, and cut into boards. Nevertheless the forms hallowed by primitive use had to be adhered to; and, while changing the nature of the materials, the builders scrupulously preserved the appearance of the ancient dwellings.

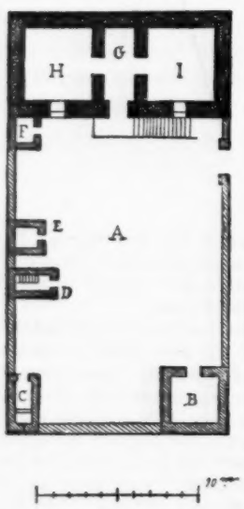


Fig. 33.

Porticos, however, were added; the rooms were more numerous, and the outbuildings more important.

The simpler houses must first be noticed. Here is one of them, fig. 33, consisting of a small garden A, with a pantry for provisions at B, latrines at C, dovecots at D, fowl-house at E, and oven at F for cooking. The dwelling part comprises a room G, open to the court, and two chambers H and I, with beds. A flight of stairs outside, made of wood, gives access to the terrace.

Fig. 34 presents a bird's-eye view of this dwelling. Four poles, fixed in fastenings left in the wall, allow the placing of an awning over the central terrace, which is made lower to afford shelter from the wind. It is there that the family love to assemble in the evening to enjoy the coolness.

We have said that the Egyptians were expert in the sciences of geometry and arithmetic. The territory was therefore divided into allotments, with the greatest care, in such a way that each inhabitant was the possessor of the quantity of land he could cultivate, or have cultivated. Accordingly the ancient priests, who governed before the kings, scrupulously preserved plans, drawn on papyrus-leaves, of the heritage of each possessor, to prevent litigation and encroachments. To draw these registered maps, it was necessary to have recourse to geometrical operations which necessity gradually improved; and it soon became evident that the triangle was the figure by which an extent of territory could be exactly mapped out, its dimensions ascertained, and its various features — such as water-courses, parts inundated or dry, sandy, rocky, or muddy — be duly indicated. The triangle was accordingly regarded as the sacred figure, — particularly the right-angled triangle, whose base divides into four, the side into three, and the

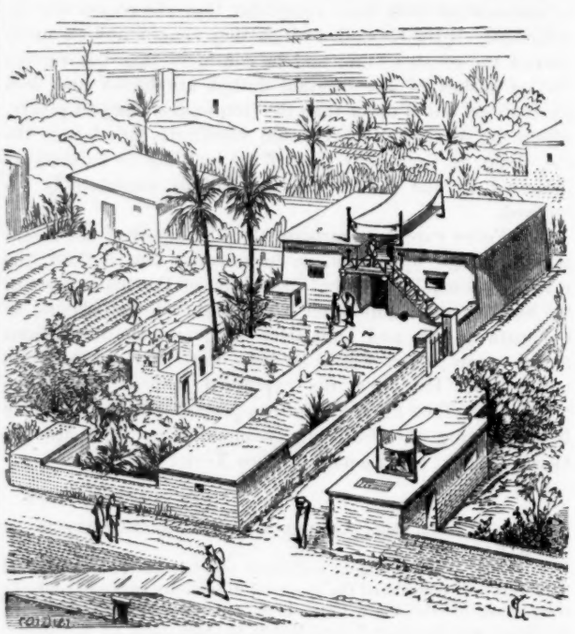


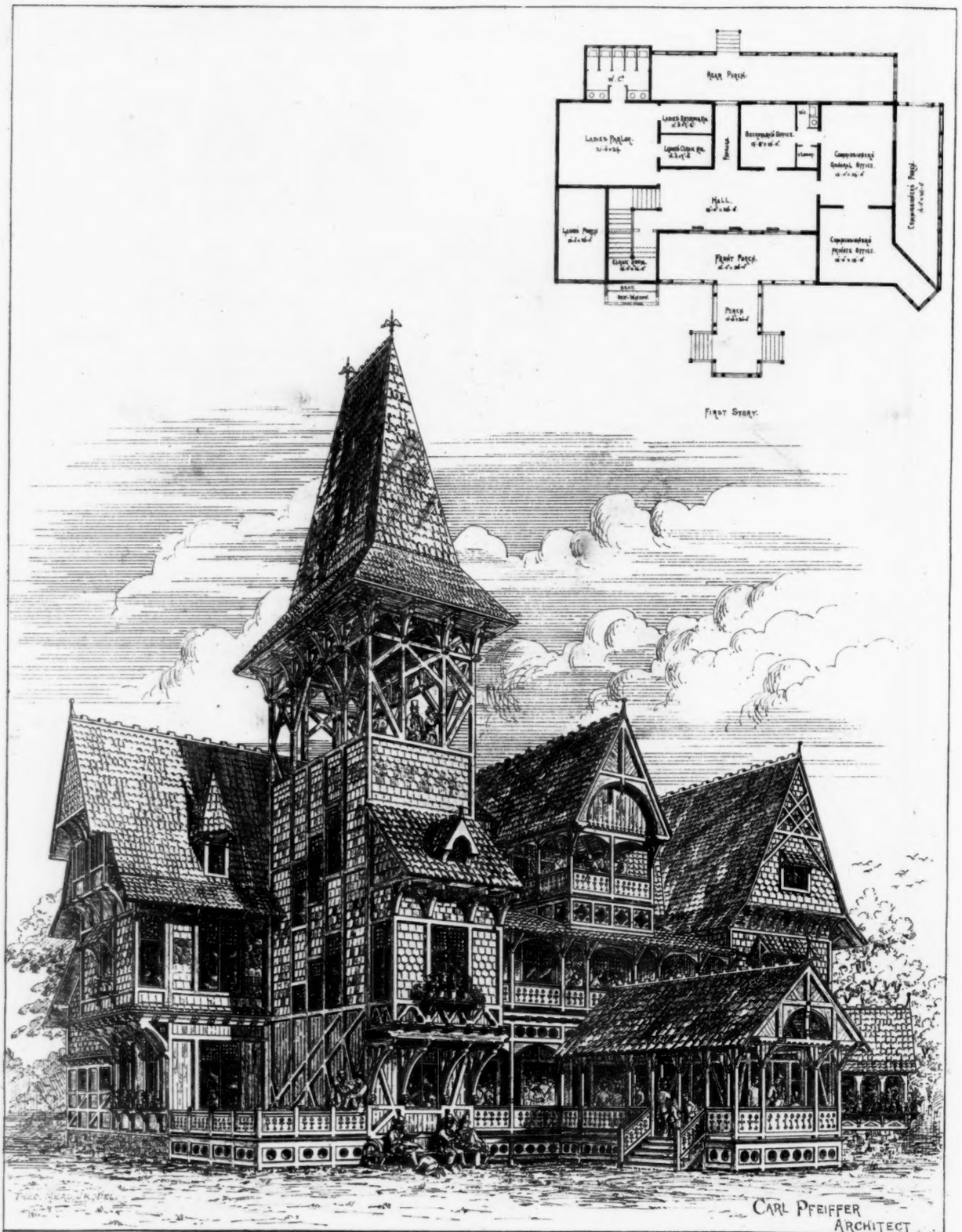
Fig. 34.

hypothenuse into five equal parts; so that this figure had to be adopted by architects in the construction of the palaces and temples.

The equilateral triangle and the rectangle were likewise regarded as perfect figures; and on this account the assembly mentioned above judged it wrong to listen to the observations of Epergos. As to the religious ideas attached to these figures, they must not be spoken of. They are mysteries known only to the priests; suffice it to say, that that side of the right-angled triangle which divides into three represents Osiris; the base, divided into four, Isis; and the hypothenuse, Orus, composed of the two, since the square of 3 is 9, the square of 4, 16, and the square of 5, 25, i.e., $9 + 16$. This triangle, therefore, being the perfect figure, if employed in the setting out of buildings, could not, they argued, but produce excellent results; it was consequently prescribed, as well as the equilateral triangle.

As regards the method to be adopted in applying the perfect triangle in buildings, this is how, after long consideration, the priests proceeded: —

Let ABC (fig. 35) be the perfect triangle whose base contains 4, its side 3, and its hypothenuse 5 equal parts. On the centre of the base AB they erected the perpendicular DE, giving it a length equal to half the hypothenuse ($2\frac{1}{2}$); they then joined the points AE, BE, and thus obtained a triangle which they regarded as the stable figure *par excellence*. Inscribing the triangle ABC in a circle, they drew from the point B a perpendicular BF on the hypothenuse, which they produced to H on the circumference of the circle. Then from the point of intersection F they let fall a perpendicular upon the side CB; they divided each of the parts of the base into 100, and obtained 400 subdivisions. Similarly dividing the line DE, they obtained 250. The chord BH gave them 480 parts equal to the last; the part AF of the hypothenuse, 320; the remainder FC, 180; the perpendicular FK, 144, or 12×12. Thus the figure furnished decimal and duodecimal divisions. Now, in assigning proportions to buildings, the duodecimal system has the advantage of being divisible by halves, quarters, thirds, and sixths, and the decimal system by tenths. The combination of



New Jersey Headquarters-Centennial International Exhibition · 1876 ·

HELIOTYPE

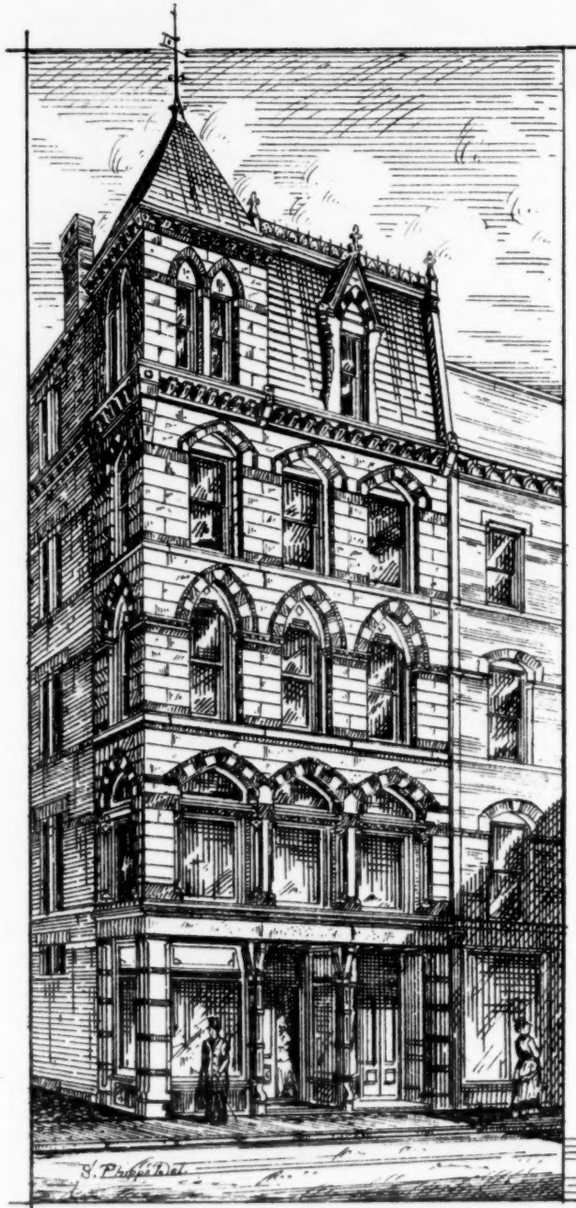
JAMES R. OSGOOD & CO. BOSTON

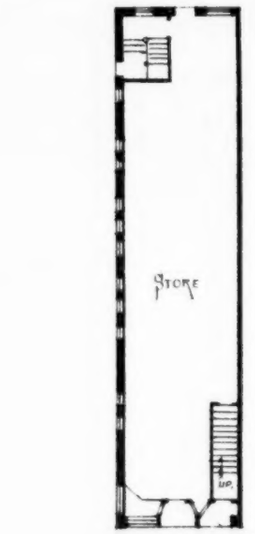
HELIOTYPE

JAMES R OSGOOD & CO BOSTON

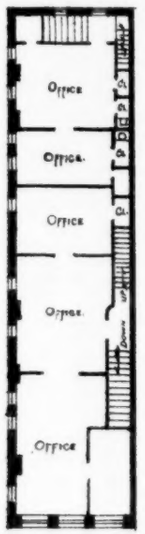
House at Beverly Farms, Mass, belonging to Henry Lee Esq.

HALL AND STAIRCASE FOR C.H.JOY ESQ.

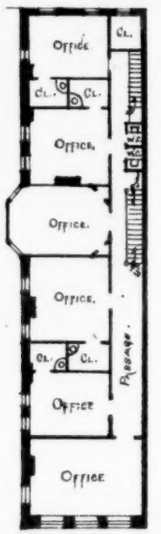




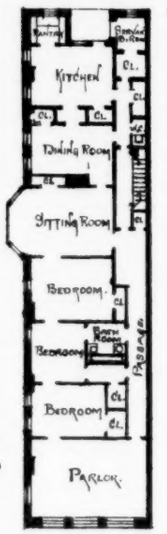
First Story Plan.



Second Story Plan.

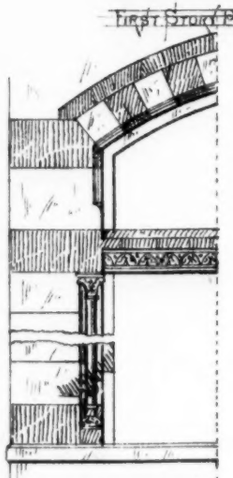


Third Story Plan.

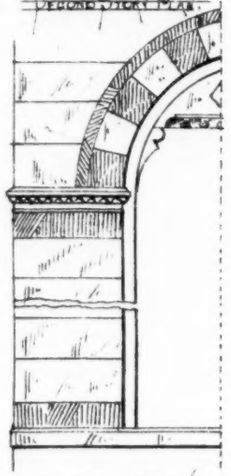


Fourth Story Plan.

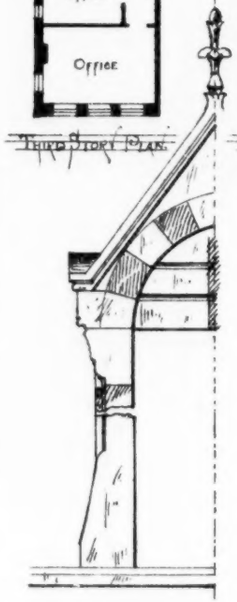
Scale of 1/8" = 1 Foot.



Second Story Window.

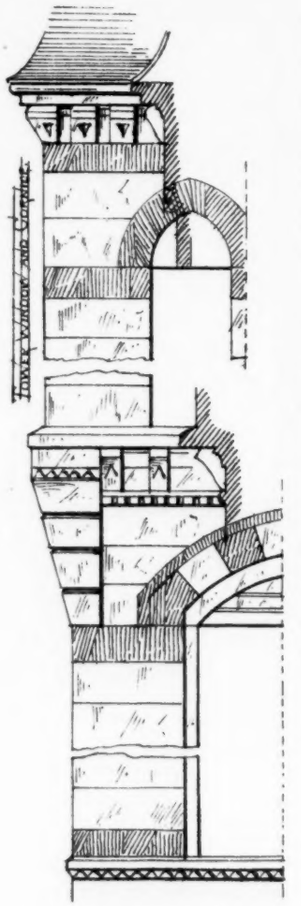


Third Story Window.



Dormer Window.

Scale of Details 1/2 Inch = 1 Foot.



Tower Window and Cornice.

Fourth Story Window and Main Cornice.

Building on Main Street, Worcester, Mass.

Stephen C. Earle and James E. Fuller, Architects, Boston.

Heliotype

James R. Osgood & Co. Boston

the two systems yielded serviceable relations. Thus the base AB divided by the duodecimal system into 48 parts is commensurate with the chord BH, divided by the decimal system into 480.

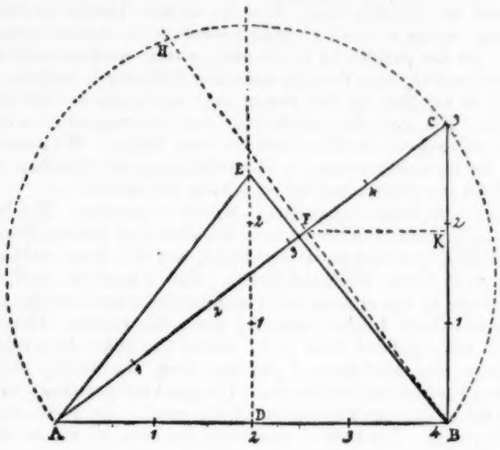


Fig. 35.

The builders therefore made use of this kind of standard of proportions in their constructions, it being left to their discretion also to employ the equilateral triangle, as we shall presently see.

THE ILLUSTRATIONS.

NEW JERSEY HEADQUARTERS, CENTENNIAL INTERNATIONAL EXHIBITION, 1876. MR. CARL PFEIFFER, ARCHITECT.

This building is about 45 x 82 feet; is two stories high, with rooms in the attic for a janitor and family. It is built of timber. The frame-work is shown in the first story, also in the tower. The walls of the second story are covered with red, flat tiles; the roofs are covered with moulded tiles, — all manufactured by H. Maurer at Woodbridge, N.J. The building is put up in such a way that it can be taken down in sections, and readily removed, and put up elsewhere after the closing of the exhibition, when it is to be sold. No plastering is made use of, as the inside is lined with boards or wainscoting from floor to ceiling. The building is to contain the offices of the State Centennial Commission, and to afford a place of rest to weary Jerseymen during their visit to the Centennial grounds. On the first floor are to be the commissioners' offices, ladies' parlor, toilet and cloak rooms, and a hall of 15 x 38 feet. In the second story is a parlor for men, toilet and cloak rooms; these, as well as the ladies' rooms, are fitted up with wash-basins and other conveniences. In the second story there is also a room 43 x 18 feet, which is to be used as a meeting-room by the Jersey exhibitors, to deliberate upon matters of interest. The general hall for the public in the central part of the building in the second story is 30 x 38 feet. The stairway leads up to an observatory from which a view may be obtained of the grounds and buildings.

The cost of the building will be about $8,000, including grading and fencing.

COUNTRY-HOUSE AT BEVERLY FARMS, MASS., FOR HENRY LEE, ESQ. MESSRS. CABOT AND CHANDLER, ARCHITECTS.

This house at Beverly Farms was originally built in the year 1845 by its present proprietor, Mr. Henry Lee. During the past year, it has been entirely remodelled and enlarged. The interior finish is largely made up of old wainscoting and panels taken from the houses of the ancestors of Mr. and Mrs. Lee; and all new finish is made to correspond. The staircase has the old hand-made twisted balusters and newel post. All this finish is of pine, painted. Particular attention has been given to ventilation. Every closet in the house has a tin tube passing from its ceiling into a wooden trunk which is built under the ridge from gable to gable, making an uninterrupted passage for outside air. This system is found to work admirably. Each water-closet has its soil-pipe continued up through the roof. The rooms have open fireplaces. The kitchen is separated as much as possible from the main house, and is built on a lower level than the principal floor, in a projection by itself; and the ceiling is finished on the slope of the roof. The range flue is built between two twelve-inch flues made for the special ventilation of the kitchen. A dumb-waiter connects kitchen with servants' hall. The finish of the outside is shingles on the gable, and clapboards on the main body of the house. The shingled roof is painted a dark red, the shingles on walls a pale gray green, the clapboards a pale drab, the trimmings a light Indian red, and the window-sashes a dark Indian red.

The construction of the upper stories gave so good a motive for its decoration in half-timbered work, that this means of emphasizing the construction has been carried throughout the design. The posts supporting projection of second story, as well as those of piazza, are of solid wood. The floor of piazza is paved with square brick tiles against a curbing of North River stone.

INTERIOR OF HALL IN THE HOUSE OF MR. C. H. JOY. MESSRS. STURGIS AND BRIGHAM, ARCHITECTS.

The finish of this hall, including staircase and ceiling, is of brown ash; the carved panels in the mantlepiece are of oak; the floor is of hard wood; the fireplace is of freestone with tile hearth.

An interior view of the library of this house was published in our issue for Jan. 15, 1876.

BUSINESS PREMISES AND DWELLINGS, WORCESTER, MASS. MESSRS. EARLE AND FULLER, ARCHITECTS, BOSTON.

This building fronts on Main Street, with the side on a court twelve feet wide.

The materials of the front are white marble and blue stone; blue-stone belts are carried through in the brickwork on the side adjoining the court.

The first three stories are used for business purposes; the upper two are flats for dwellings, the plan of one being substantially a duplicate of the other.

A NEW PROFESSION.

[COMMUNICATED.]

Do we not need a new profession? Is there not a field as yet unoccupied, notwithstanding the great numbers of specialists that have grown up in the division of professional labor to meet the wants of our advancing civilization? It is not a new artisan that is needed; nor is it exactly a new specialist.

There have come up with the application of science to the arts of practical life, more especially as connected with our domestic life, a great variety of luxuries, comforts, conveniences, necessities, which rest upon contrivances more or less complicated, and as a general thing but imperfectly understood by the average occupants of the houses, and still less understood by the average servant. Let us glance at the various employments that are involved in the erection and arrangements of a well-appointed modern dwelling-house.

We have, besides the landscape-gardener and the architect, the decorator, the carpenter, the stairmaker, the sash and blind maker, the glazier, the roofer, the mason, the plasterer, the plumber, the gas-fitter, the locksmith, the bell-hanger, the burglar-alarm man, the furnace and range man, the painter. After the several subordinates have completed their work, and the dwelling is turned over by the architect, and accepted, at first glance the occupation of the artisans seems to have been terminated. In reality that of some of them has only just begun. The plumber is established for life, as the next winter's frost will show. In his train will come the plasterer and decorator to restore the ceiling, flooded and discolored if not thrown down by the bursting of a forgotten pipe. The roof will leak, and the slate must be renewed. The ventilation will be found to be inadequate or imperfect. The fireplace will smoke, or the chimney refuse to draw when the wind is in a particular quarter. The warming will be partial and irregular. The fire in the furnace will burn fiercely, or go out altogether, or warm only the lee side of the house. The carbonic oxide will escape through the joints of the castings to poison the air of the house. The gas-jets will flicker or diminish. The friend will ring, or attempt it, and repeat the attempt, and leave because no one comes to the door. Ice will fill the eavestrough, and the water from the melting snow will overflow upon the doorstep. The range will not bake. The boiler connected with the water-back will leak or become overheated. The waste-pipes will clog. The closets will become obstructed, and will be offensive when clear. The water through the pump or from a hydrant will be objectionable, or fail. Mosquitos, cockroaches, ants, water-bugs, rats, mice, and moths will be regarded as necessary evils to housekeeping. The house will become the abode of colds, or the visiting place of typhoid or diphtheria or malaria with its train of ills, — the evidences of imperfect draining, warming, and ventilation.

Is there relief from this formidable array of ills incidental to domestic life? Do they not point to the need of a new profession akin to that of engineering, or to that of engineering and medicine united?

Consider on what these ills rest. In part, they rest on faulty construction at the outset; but also, and perhaps more, on the fact that the house is a *human* habitation, with somewhat complex contrivances, not wholly clear in their modes of action to the comprehension of the average proprietor, and yet placed in the charge of less competent servants, — contrivances more or less perishable, however well constructed, and dependent for successful working on constant conditions, while the actual conditions of working are constantly varying. To find out what the difficulties are, and what should be done to remedy them, requires the presence and service of a scientific and practical mind, — a mind which in some sense is a repository of the experiences of gas and lead pipes, of furnaces and chimneys, of ventilation and drainage. The accumulated experiences would of themselves enable the possessor, if a man of proper training, to give most valuable counsel.

Such a repository would be the man who, having received a sound scientific and technical education in physics, mechanics, chemistry, hydraulics, and especially in practical hygiene, and such general higher education as would give him title to the respect and confidence awarded to culture, sets himself apart to be the "house physician," "the sanitarian," — the efficient and consulted professional brother of the "family physician." He would have his well-defined field of professional labor. It would be his duty to find out from symptoms what the real troubles are in the ill-working apparatus of the dwelling-house. Having found them out, he would make a sketch — a written prescription — for the changes to be made by the plumber, or mason, or gas-fitter, or other artisan; and this operative would carry out the work prescribed.

The "house physician" would receive a small professional fee, corresponding, as an established rate, in amount perhaps with that of the family physician, for services requiring an equal amount of time. The fee need not be large. The profession is for life. As he wins confidence, and his experiences accumulate, his services will be in greater demand, and his counsel will be sought, and so his professional income be correspondingly increased. He will have his patrons (or his patients), who will call upon him with the freedom and confidence and frequency with which they call on their family physician.

Let us see how this would work. It would extinguish the guesswork of the average plumber. He would be employed to carry out prescribed work, and be paid for *time* work, once for all; and not for doing the same work over and over, each time in a different way, and always more or less imperfectly, because of the ignorance of the workman, and because much of his work in a difficult case is but guesswork at the best. What is true of the plumber would be true to a larger or lesser extent, in cases of real difficulty, with most of the other artisans. Then we should have relief from annoyance *promptly*, and not go on vexed in temper as well as in our comfort and convenience, because the artisan in former cases had tried, been paid, and had given no valuable return. With perfected drainage, warmth, light, water-service, and ventilation, would come improved health to the household, increased cheerfulness to the domestic service; and, while augmenting the comfort and refinement of our homes, we should increase our days of capacity for effective labor, lessen our physician's bills, and, as a whole, the class of bills connected with house alteration and repair, which grow out of imperfect because ignorant work. Finally, such an established professional service would improve the plans and details of dwellings to be hereafter constructed, because it would provide for the gathering and preservation and intelligent reading of the lessons of household experiences.

It is scarcely to be expected that these suggestions will be acted upon at once; but it is not too much to say that if a considerable number of the well-educated young men of our cities and towns would devote themselves first to thorough preparation, and then to the sphere of service here indicated, they would enter upon a most useful, honorable, and in the end lucrative field of labor, — more certain in Massachusetts to bring a thoroughly satisfactory return, in the way of position and income, than the average that awaits the lawyers, physicians, and clergymen of the Commonwealth.

More than eight thousand tombs have been opened in the island of Cyprus with the hope of finding art treasures.

CORRESPONDENCE.

Chicago.

The history of Chicago is now distinctly divided into two periods, the division being the great fire. The pre-igneous period concerns us but little now. It seems to have passed out of the memory, except to recall pleasing reminiscences or draw comparisons. As fire purifies by its intensity, so may we reasonably look for fresh and vigorous thought and action following in its path. It is safe to say that for this reason the new Chicago is better than the old. The great fire purified our local government for a time, but in this respect its effects have not been lasting. We naturally look for its visible results in the rebuilding, the leviathan task which for two years taxed our capacity to the utmost.

The geographical disposition of our city is peculiar. The business portion comprises the centre. Separate and distinct from it, and divided by well-defined boundaries, are the three residence-quarters, — North, West, and South. Each is a city in itself, and is traversed by one or more retail thoroughfares and several lines of horse-railway tracks, radiating from the centre. The two former are separated from it by rivers; the latter, by a void of buildings, the desolation of the two fires, the middle ground between business and residences. The great fire practically swept away the business centre and one of the arms, "the North Side" as it is called. The task of rebuilding has been to restore these two. The business centre has been almost entirely rebuilt. The North Side has been only about half rebuilt, and is now in hand. Though there is considerable work in progress there now, there is much less activity in building than existed a year ago. We can therefore now take an opportunity to review the field while a truce exists between capitalists and builders.

The business quarter has had no competitor, and comparison cannot be made with any other business quarter; but the North and South Divisions are the homes of architecture, and the fields for artistic effort. The North has had the opportunity to begin again, and have every thing new, an occasion by which it has not failed to profit with advantage; but during this time the South has continued to build. It has erected some of the best dwellings we have, within four years past, and its wealthy citizens have already projected others; but the North has reserved its best sites, and the oldest families and the wealthiest, all of which are attached to their old localities, have not yet rebuilt. There is therefore a great field here for the architect and the builder, and I doubt not that it will be well contested. Already a grand work has been done in tree-planting. It is seldom that small saplings are set out in this city. Large trees are demanded; and as tree-planting is no more an experiment, but an established business, they are cheap. Our level roads, and the fine forests and groves of second-growth trees north of this city, give all the facilities desired for an extensive practice of tree-culture. It is not uncommon to see long lines of trucks passing through the streets, each with its tree from six to ten inches in diameter, and its cheese-shaped lump of frozen roots. This winter two hundred of these have been planted in Lake Park, which follows the lake shore directly in front of the business part of the city for a length of one mile; and I do not know how many thousand have taken root in the North Division during the four years since the fire. This Lake Park, by the way, is a new acquisition, and is laid out where formerly was a basin, which the rubbish of the fire has enabled us to fill in completely.

The architecture of business Chicago is more familiar to travellers than that of her homes. It is not unlike that of other business cities, except that it displays rather an exuberance of ornament in many buildings, which is not in keeping with the objects for which they are intended. This is an old folly which has been too much practised since the fire. Formerly the so-called "gingerbread" architecture flourished here as it never did elsewhere; but it now grows most luxuriantly on the soil of San Francisco, whose boasted buildings are very much like what those of Chicago were ten years ago. It is pleasant to think that in its western course it bids fair to be drowned in the Pacific, which may literally be the case some day; for our western rival may yet have an earthquake which will rival the fame of our fire.

In the midst of the general mediocrity of cheap and showy buildings, we have many substantial and a few beautiful ones. The great building of the American Express Company, designed by Gambrill & Richardson, and built under the superintendence of Wight, comes under both categories, and may safely be called the best in the city. It is, as far as I know, the only good modern example of the thirteenth-century French architecture, as it was employed in civil buildings, so few remains of which are now extant. It employs the lintel throughout; and, as some of the

openings are seven feet wide, the stones are large ones. It is well adapted to the stone of this section, for it is as easy to procure large stones as small ones. All building-stones are brought here in large pieces; and it is folly to break them up in order to acknowledge subserviency to styles of architecture.

Besides the above, we have the Portland Block, by Jenny; a substantial example of fine brick and stone work, with inlay of tile. We have several office buildings in Gothic; and Gothic with French treatment as practised by Viollet-le-Duc, as well as by Mr. Hunt of New York, in the Presbyterian Hospital and Stevens Hotel.

The ease with which we can procure not only red and yellow, but several other tints of brick, has led to the erection of several good examples of polychromatic brick architecture. Five large buildings of this kind were erected from designs by the late firm of Carter, Drake, & Wight, and one by S. A. Treat. The finest building now in course of erection in the business city is the new Chicago Club House, by Treat & Foltz, on Monroe Street, opposite the Palmer House. Of this I will, hereafter, give you such an account as it deserves.

The dwelling-house architecture of Chicago has always been far behind that of her business buildings. It has been an admitted fact that Chicago had no homes. Her population has always been so transient, and the spirit of speculation has been such, that no one ever thought of living long in one house, or of making it a comfortable home. Every one was aspiring to a higher state; and no one felt warranted in building for permanence. The frame buildings which were the rule — stone or brick being the exceptions — were always built with heavy sills, so that they could be moved away. The best avenues were cluttered with mean, cheap frame houses; the property-holders thinking them good enough to make interest and taxes until the property should be valuable enough for more permanent structures. But they little thought that by thus covering whole neighborhoods with poor buildings they were accumulating such a number as it would be impossible to move away; and that thus they were keeping down the value of property, and making what in a short time might be elegant streets, only second-class neighborhoods. The result has been that those who wished to build good houses have gone off to remote and less desirable quarters. It is thus that our two finest avenues, Michigan and Wabash, have been greatly injured.

It was not many years ago, the great, pretentious house of the late Peter Shuttler was here considered a famous piece of architecture. It attracted most attention because it was large, and the owner had resorted to the absurd extravagance of sending to New York for the marble "trimmings," while Chicago furnished the magnificent wooden cornices and piazzas. Then among the lately grown fashionable swell fronts of Prairie Avenue, which is one of the fashionable streets of the South Division, about six years ago the Thompson mansion was reared. It is an irregular isolated building, very large on the ground, and with a great tower, most carefully built of Philadelphia brick and Connecticut brown stone, the latter wrought into the most extravagant and fantastic forms that were ever conceived. The fashionable world of Chicago went wild over this structure; and to say it was not the most magnificent pile ever reared by man, was enough to have you branded as an ignorant and uncultivated dolt.

Just before the fire, the first really artistic dwelling-house in the city was commenced; and it happened to be located directly opposite the house last mentioned. This was the work of Mr. R. M. Hunt, and was for Mr. Marshall Field. It is creditable to his sense of the beautiful, that he should have turned his back upon the Chicago architects, who had done so little to beautify their city, and go to such an architect as Mr. Hunt. This house, large, costly, and elegant both in its exterior and interior finish, is now completed. It is a good example of Mr. Hunt in his best moods, and was not built to frighten the inhabitants, as was one of his efforts at about the same time in Boston. It will always be a fine example of house architecture for our citizens to contemplate.

FIRE-PROOF CONSTRUCTION.

Baltimore, Md.

To the Editor of the American Architect and Building News.

Dear Sir, — I perceive by a communication in your number of Feb. 26, that I have in my remarks on "Fire-proof Construction" aggrieved the proprietors of one of the "innumerable modern inventions" referred to in their criticism.

I have examined the certificates published by these gentlemen, in relation to some buildings provided with their floors, which were exposed to the fire in Chicago; and can find nothing therein to disprove the truth of my statement relating to the inutility of attempting "to construct buildings which would preserve uninjured themselves and their contents when exposed to such heats" as were generated during the Chicago and Boston fires.

In the first place, I do not consider the owners of buildings competent judges as to whether the floors fail because the walls are defective, or whether the walls are overturned by the pressures induced by the expansion of the iron beams and arches. Nor do I consider it a very simple matter to counteract this force, acting fifty feet above the base of the wall.

If the heat was not great enough to warp and twist the beams on which the arches rest, either brick, concrete, or iron arches, properly built, would have stood the test; but then the fire would not come within the limits as to heat covered by my opinion.

The fire records of the past twenty years are so filled with the evidences of the failure of iron beams and columns when exposed to intense heat, that it would be absurd to trespass on the columns of a professional journal with the details. This failure is the simple result of obedience to the laws governing the chemical and molecular structure of the material, and which it is impossible for "corrugation" to alter or eliminate. Therefore, *corrugated* iron is no more fire-proof than sheet-iron of the same thickness non-corrugated; and no iron is, strictly speaking, fire-proof.

I know nothing of the details of the Brooklyn Tabernacle; it is a well-known fact that, when built, it was widely advertised as a type of the revolution in the fire-proof building world that corrugated iron was to effect; and therefore I had a right to class it among such constructions.

I am tolerably familiar with the contents of the catalogues of our principal iron-manufacturers, and have never seen among them a roll similar to the Zorée girder; and, notwithstanding the assertion of Messrs. Dwight & Co., I do not believe it is rolled in this country to-day. I know it was not when my paper was written.

I am not aware that I indorsed, or am at all responsible for, the repeated results of the Paris experiments; at the same time (regardless of theory as expounded by anybody,) since the report came from reputable expert authority, the result cannot properly be called "impossible," without other experiments to prove it.

I am not particularly interested in the latter paragraph of Messrs. Dwight and Co.'s letter; but do not perceive why any intelligent man, even though he is a sculptor, cannot observe and report upon such simple facts as did Mr. Powers. I do not exactly know what Mr. Powers did say; but if it was to the effect that a good strong plaster or mortar, of sand, carbonate and sulphate of lime, proved an excellent protection against the spread of fire, when used freely over and around either wood or iron, he said a good thing, though he was only a sculptor.

Respectfully, &c.,

N. H. Hutton.

THE NEW YORK STATE CAPITOL.

[communicated.]

The modified designs for the completion of the new Capitol of the State of New York are the result of a state of things intrinsically very singular, though so common and well established as to have attracted far less comment than it deserves. But it is a highly discouraging state of things for the art of architecture; and it is only through the exertions of the body of architects that it can be remedied. The State had clearly outgrown its old State House, when the project of building a new one was first broached. The first step towards the execution of it was to hand it over to a board of Capitol Commissioners, some of them officials we believe, others eminent unofficials; all, so far as appears, perfectly respectable and estimable citizens. This board first selected and secured a site. Then it advertised for plans. It invited mankind to come in and compete for the chance of building the Capitol of New York; offering mankind, as usual, a rather sketchy programme of requirements, offering no considerable "consolation purse," and offering the person whose drawings it preferred the appointment of architect, and the uncertain status and uncertain emoluments attached to that station. The programme was necessarily sketchy. If the commissioners had set themselves to work to make a full and definite programme of what they wanted, or if they had in any other way taken the pains to find out just what they wanted, they would have seen that they were inviting

every architect, but one, in the country to do three months' work, at least, for nothing, and that one to do it on the chance of getting an employment of uncertain tenure at uncertain rates. If this proposition had been put to them plainly, they would have seen that what they would get would be either the designs of architects who had nothing else to do, or the slight and hasty sketches of architects who had something else to do; in other words, the best work of presumably bad architects, or the worst work of presumably good architects. What they really wanted was a "magnificent pile." They got a picture of what seemed to them a magnificent pile, and accepted the same. The result is, that the State has a Capitol half built, which can neither decently answer the purposes of a State House, nor tolerably express them; and, after all that the architects of the Advisory Board could do to remedy its defects, it is the deliberate opinion of good judges, that the best and cheapest thing for the State would be to abandon the unfinished Capitol altogether, and put up a new building with the money which is estimated to be necessary to finish it. The improvements which the Advisory Board have effected, and the appointment of an Advisory Board capable of effecting improvements, seem to be due to the fact that Lieut-Gov. Dorsheimer, *ex officio* head of the Capitol Commission, happened to be a man of some discernment and some sense of responsibility in æsthetic matters, though of course his election was on grounds entirely irrelevant to those traits. It is submitted that this is rather a precarious tenure for a great State to hold its chance of a decent public building by.

THE RHODE ISLAND CHAPTER A. I. A.

PROVIDENCE.

TO THE EDITOR OF THE AMERICAN ARCHITECT AND BUILDING NEWS.

WE of Rhode Island would much like to know what is doing by our associate Chapters, and wish that all would follow the lead of Boston in publishing an abstract of their proceedings.

We have ourselves fairly completed the work of organization, and entered into our labors.

Our members have been much interested in the proposed action in favor of the metric system; and a paper on the subject has been read by one of them before the Board of Trade, and also before the Franklin (Scientific) Society. At the special meeting, Feb. 16, the Chapter unanimously voted to memorialize Congress in behalf of the movement, and to invite the Board of Trade to join it in so doing. The Franklin Society also voted in favor of action in the matter.

We have also taken the preliminary steps for the procuring of proper building-laws for the city; and, at the last meeting of the Board of Aldermen, the Chapter presented a petition for the appointment of an Inspector of Buildings to enforce the existing imperfect laws, and also requested the immediate appointment of a commission for the preparation of a proper law.

Providence has an unusual number of public buildings now in progress. The City Hall has reached the level of the second floor; the Court House and new Library for Brown University are at the ground line; several schoolhouses and police stations are in progress; the new hotel is nearly ready for plastering; the State Prison is making good progress; and, as the low prices are inducing much private work, the prospect is of a busy season here.

THE SECRETARY.

NOTES AND CLIPPINGS.

A RECENT scheme for providing Glasgow with new baths and wash-houses, for the benefit of the poorer classes of the city, includes the rebuilding of the present baths in London Road, and the addition of new buildings on the Green, in place of the present inadequate washing-house at the corner of William, Calton, and Greenhead Streets. The new buildings will be classic in design, with a high elevation east and south, extending a hundred and forty-eight feet along the Green, and a hundred and eighteen feet on William and Greenhead Streets. The eastern division is to be devoted to bathing purposes, and the western to clothes-washing. Provision will be made for about a hundred dressing-boxes, a swimming-bath eighty-four feet long by forty-five feet wide, lavatories, and several private bath-rooms. The lighting will be from the roof. The clothes-washing department will be provided with thirty separate washing-stands, each to be furnished with three tubs, hot and cold water taps, and a drying stove. Due provision is to be made for ventilation and drainage. The alterations at the London Road baths comprise, on a small scale, substantially the same improvements proposed in the new buildings, and will be proceeded with immediately. The new buildings on the Green will be begun when the preliminaries are arranged.

AMONG the many devices for preventing the spreading of contagion in hospitals is the practice of coating the walls of hospital wards with some insoluble glaze which can be washed and kept perfectly sweet and pure. The most recently invented of these glazes is Griffith's enamel, which is said to be unaffected by the action of carbolic acid, and hence useful for coating the inner walls of fever wards in hospitals. Plates of iron covered with this enamel, and exposed to the prolonged action of sea-water, are said to be kept fresh and clear from seaweed, the iron itself showing no signs of rust after the enamel is scraped off. It has been used by the British and other foreign governments. In India it is reported that it does not blister under the sun's heat. It has also been found effectual as a protection against white ants.

ONE of the streets in Virginia City, Nevada, has been steadily sinking for several days, though there are no mines in that part of the town. In some places the street sunk ten or twelve feet; but the residents felt no anxiety, as a similar phenomenon occurred several years ago, doing no damage.

A HOUSE has been lately built at Port Chester, N.Y., entirely of beton, which has been employed not only for the walls, partitions, and stairs, but also for the floors, dormers, and roofs. Iron girders, cased in beton, are used in the floors, forming deeply coffered ceilings to the rooms below. Iron is likewise used for roof rafters. The employment of iron in the construction is thought to have been useless; for, though the beams are seven feet and a half on centres, a floor of eighteen feet span supports a load of thirty tons without showing the least deflection.

The building has several interesting features; among them a balcony weighing nearly four tons, and projecting four feet from the face of the building; partition-walls two and even one inch thick, rising to a height of thirteen feet. The outer walls are two feet thick, in which circular flues have been left connecting with the spaces between the floors and the ceilings. All the main partitions are built in the same way. It is intended to heat the building by radiation from the partitions, floors, and ceilings. Heated air from a furnace is to pass up the flues in the walls and partitions, through the spaces between the floor and ceiling, and return to the furnace without having directly entered any room.

THE Archæological Museum of Madrid has lately acquired a fine and varied collection of Roman antiquities, collected by Señor Caballero Infante. The interest is considerably increased by the fact that every specimen has been found in the provinces of Spain.

THE dial of the great clock in the clock-tower of Westminster Palace measures twenty-two feet in diameter. This is supposed to be the largest clock-dial in existence before whose face the clock hands move. There is a much larger clock-dial at Mechlin, which measures forty feet in diameter; but this clock has no hands. The clock has what is called a gravity escapement, which was invented by Sir E. Beckett, and is now commonly used in large clocks. Five bells are hung in the tower, and upon these the "Westminster chimes" are rung at the hours and quarter-hours. The largest bell, which weighs thirteen and one-half tons, has been cracked by the use of a hammer which was too heavy for the poorly amalgamated metal of the bell. The hammer now in use weighs only four hundred weight, or half as much as the original hammer. The other bells weigh four tons, thirty hundred-weight, and twenty hundred-weight respectively. It takes only ten minutes to wind up the going-part; but for the striking-parts — the hour and the quarter parts — it takes five hours each, and this has to be done twice a week. The clock varies only one second for every eighty-three days. The pendulum weighs six hundred and eighty pounds, and can be accelerated one second a day by adding one ounce to its weight.

A LIGHT-HOUSE of granite has been constructed in England, which is to be shipped to Ceylon, and there set up. It is circular in plan, about a hundred feet high, and thirty broad at the base; is built in sixty-four courses, of which the lower fourteen are solid. Above these are seven stories vaulted and floored with stone.